Albrecht®
Kommunikationstechnik aus Norddeutschland

AE 497 S

AM/FM/SSB 10M BASE/MOBILE RADIO

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INSTRUCTION MANUAL

SPECIFICATIONS

GENERAL

Frequency Range..28.000 to 29.699MHz
Frequency Control..Phase Lock Loop (PLL) synthesizer
Frequency Stability..±300Hz
Frequency Tolerance..0.003%
Emission Mode..A3E(AM), F3E(FM), J3E(SSB)
Microphone..Plug in electret ; with push-to-talk
Switch and coiled cord
Input Voltage..13.8V DC nominal, 15.9V max, 12.0V min
220V AC
Size (WDH)..300 x 240 x 85mm
Weight..3.4Kg
Antenna Connector..SO-239 50 ohm unbalanced
Speaker..8 ohm, 3 watts

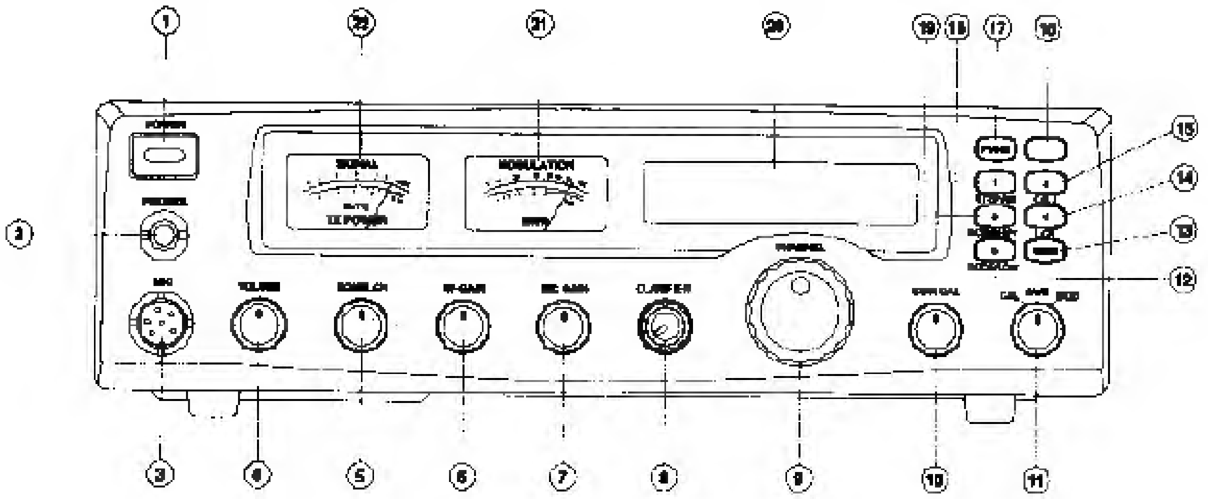
TRANSMITTER

Power Output..AM 4W, FM 10W, SSB 12W PEP
Spurious Emission..65 dB or better
Current Drain No Modulation..FM/AM less than 2.5A
SSB less than 1.0A
Current Drain at Max Power..FM/AM less than 2.5A
SSB less than 3.0A
Modulation Frequency Response
(1 KHz, 0dB Reference)..Lower, at 450Hz, AM -6dB, SSB -6dB
Upper, at 2.5KHz, AM -6dB, SSB -6dB
Microphone Sensitivity..AM 1.5mV for 50% mod
FM 1.5mV for 1KHz DEV
SSB 1.5mV for 4 watts PEP
Microphone Amplifier..AM 50dB (between 89% and 80% modulation)
SSB 50dB (between 12W PEP and 10W PEP)

RECEIVER

Max Sensitivity for 6dB S/N..AM 0.5uV, FM/SSB 0.25uV
Sensitivity for 10dB S/N..AM 0.5uV, FM/SSB 0.25uV
Overload Audio Fidelity at 6dB Down..450Hz ~ 2000Hz
Adjacent Channel Selectivity..FM/AM 60dB,SSB 70dB
Image Rejection (5.6MHz)..Typically better than 90dB
IF Rejection..70dB or better
Max Audio Output Power..AM/FM/SSB 2.5 watts
Squelch Range..Adjustable from 0.5Uv to 1mV
Receiver Clarifier Range..±1.25KHz Variable
Dynamic Range..65dB (SSB)

RADIO FUNCTIONS



1. POWER ON/OFF SWITCH
This switch turns the transceiver power on and off.

2. HEAD PHONE JACK
Connect head phone plug

3. MICROPHONE INPUT
6 pin socket for push-to-talk microphone.

4. VOLUME CONTROL
Controls audio output level

5. SQUELCH CONTROL
Used to quiet the receiver during absence of receive signals
Sensitivity to incoming signals is fully adjustable

6. RF GAIN CONTROL
Control the receiver sensitivity to reduce interference. To decrease RF gain, turn the knob counter clockwise. For the maximum receiver sensitivity, the RF GAIN control must be rotated to extreme clockwise

7. MIC GAIN CONTROL
This control provides the proper or desired modulation.

8. CLARIFIER CONTROL
This control provides an adjustment for turning in stations which are slightly OFF frequency, to optimize the AM and SSB reception.

9. CHANNEL SELECTOR SWITCH
This Rotary switch selects one of frequency in RX mode, but frequency is not activated in TX mode.

10. SWR CALIBRATION CONTROL
The calibration control provides (while keying transmitter) meter calibration adjustment enabling true standing wave ratio reference.

11. CAL/SWR/MOD SELECTION
This switch is used to select the scale to be read on the RF Power Meter. The switch has three positions MOD (Modulation), CAL (Calibrate), SWR (Standing Wave Ratio)

12. MODE/LOW/MEMORY 5 SWITCH
FUNCTION OFF ;
MODE FUNCTION - select one of the operation modes FM/AM/USB/LSB

* Load channel in the memory 5 with MEM switch.

FUNCTION ON ;
LOW FUNCTION - This switch activates tone low (high cut) circuits.

* Save channel in the 5 with MEM switch.

13. MEM SWITCH
FUNCTION OFF ;
MEMORY LOAD FUNCTION - Load one of the 5 memory channels with 5 numeric key.

FUNCTION ON ;
MEMORY SAVE FUNCTION - Save one of the 5 memory channels with 5 numeric key.

14. LCR/MEMORY 4 SWITCH
FUNCTION OFF ;
LCR (Last Channel Recall) FUNCTION - Press LCR to return to the last channel that was used for longer than 3 seconds or was transmitted on.

• Load channel in the memory 4 with MEM switch

FUNCTION ON ;

• Save channel in the memory 4 with MEM switch

15. CALL/MEMORY 2 SWITCH
FUNCTION OFF ;
CALL FUNCTION - This switch is used to access a reprogrammed frequency (memory 2)

• Load channel in the memory 2 with MEM switch

FUNCTION ON ;

• Save channel in the memory 2 with MEM switch

16. DIM SWITCH
FUNCTION OFF ;
DIM FUNCTION - This switch is used to make the lighting dimmer

17. FUNC SWITCH
BRIEF PUSH : This switch activates the secondary function of double function switches.

18. STEP/NB/MEMORY 1 SWITCH
FUNCTION OFF ;
STEP FUNCTION - This switch is used for select one of the frequency step : 1KHz/10KHz/100KHz

1KHz : Sets 1KHz digit of the desired operating frequency.
10KHz : Sets 10KHz digit of the desired operating frequency.
100KHz : Sets 100KHz digit of the desired operating frequency.

* Load channel in the memory 1 with MEM switch.

FUNCTION ON ;
NB FUNCTION - If your reception is disturbed by interference from impulse type noise (ignition noise and other electrical noise press NB to reduce or eliminate the noise)

* Save channel in the memory 1 with MEM switch.

19. SCAN/SHIFT/MEMORY 3 SWITCH
FUNCTION OFF ;
SCAN FUNCTION - Set the scan mode on/off in RX mode.

* Load channel in the memory 3 with MEM switch.

FUNCTION ON;
SHIFT FUNCTION - Press the shift switch to select the direction : +SHIFT/-SHIFT. Press more than 3 seconds the SHIFT switch to select to off-set step : 0~990KHz

* Save channel in the memory 3 with MEM switch.

20. LCD DISPLAY
LCD indicates the frequency selected.

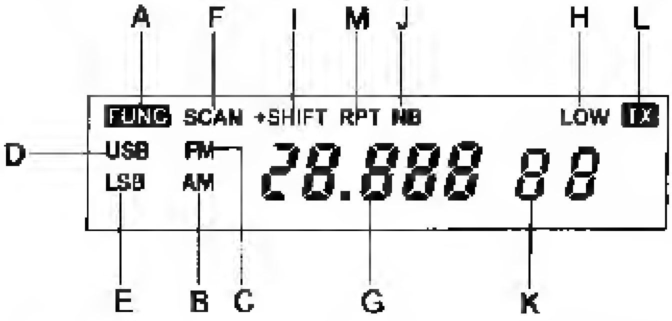
21. MOD/SWR ANALOG METER
This meter reflects SWR calibration and modulation, operated in TX mode.

22. S/RF ANALOG METER
In receive mode, this meter displays incoming signal strength. In the transmit mode this Meter displays RF power.

TONE CALL SWITCH ON THE MICROPHONE
Most repeaters require a 1750Hz Tone-burst for initial access in FM mode. (Do not operated in FM mode and SSB mode)

BEEP/TONE
Turning on power switch while keeping PTT key pressed sets beep mode on/off.

Display Panel Features : Illustrated below are all the VISUAL INDICATORS that appear on the display, and the corresponding feature function that they associate with.



Liquid Crystal Display Panel : The state of art liquid crystal panel provides the user with a visual information center on the operation and status of the AE 497S .

CAUTION : Due to the components inherent in them, liquid crystal displays should not be subjected to extremes of temperature or humidity. If the unit is exposed to temperatures below -20℃(-5°F) or above +60℃(+140°F), the display may temporarily cease to function properly, and in some cases, could result in permanent damage. Do not subject radio to extreme conditions, such as closed automobile in direct sunlight or continuous sub zero temperatures.

All liquid crystal displays have a preferred viewing angle when the display contrast is at a maximum. The best viewing point will vary by user, depending on such variables as temperature, humidity, battery condition, and the actual users eyesight.

A) Function Mode : Indicated the "Func" button has been selected, which allows for operation of many of many of the various features.

B) AM : Indicates AM mode operation.

C) FM : Indicates FM mode operation.

D) USB : Indicates Upper Sideband mode operation.

E) LSB : Indicates Lower Sideband mode operation.

F) SCAN : Indicates that the radio is in the "scan" mode which works in conjunction with all frequency and five memory locations.

G) Frequency Readout : Displays the corresponding frequency associated with the channel you are communicating with.

H) LOW : Indicates that the Tone Low features has been turned on.

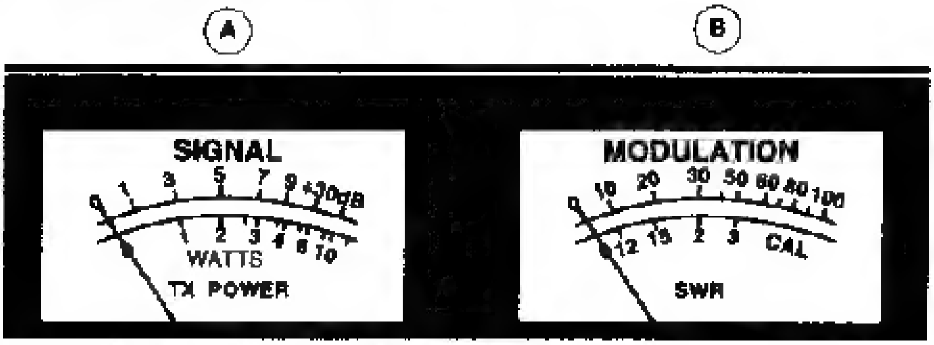
I) SHIFT : Indicates that the SHIFT (+ and -).

J) NB : Indicates that the Noise Blanker features has been turned on.

K) "L" : Indicates that the memory retrieval mode has been activated
"S" : Indicates that the radio is in the "Memory Store" mode, ready to receive a channel into one of the memory locations.

L) TX : Indicates that the radio is in the "transmit" mode.

ANALOG INDICATOR METER :



A) S-TX METER : Indicates relative incoming signal strength and RF out put power.

B) Modulation Meter : Measures the percent modulation of the AM signal. Note that the CAL/SWR/MOD switch must be in the "MOD" position for the meter to measure and read modulation.

SWR METER : Measures the ratios of standing wave ratio of the antenna system, which is critical in properly adjusting the length antenna and all related electrical connections. This meter will indicate if there is any major changes in these critical areas caused by such things as humidity, vibration, or corrosion, which will cause the SWR Meter to rise. A rising SWR indicates that a problem exists.

To Calibrate SWR :

a) Set the radio into the AM mode.

b) Switch the CAL/SWR/MOD knob to the SWR position.

c) Transmit by pressing the PTT button on the microphone, and adjust the SWR/CAL, control until the needle reaches the CAL position on the meter.

d) Put the CAL/SWR/MOD knob back to the SWR position, and read the SWR value.

INSTALLATION

1. LOCATION OF THE RADIO
Prior to beginning operation of the transceiver, a basic installation must be prepared. Installation of the transceiver itself is a rather simple procedure. In selecting the location for the unit, two basic factors must be considered :

A. Access to 220V, 50Hz, or 13.8V DC power source.

B. The location must be convenient for running the antenna lead lead in cable if an outside antenna installation is proposed.

2. BASE STATION ANTENNA
Since the maximum allowable power output of the transmitter is limited by the Regulation, the antenna is the most important factor affecting transmission distance. Only a properly matched antenna will allow maximum power transfer from the 50 ohm transmission line to the radiating element.
The recommended method of antenna turning is to use the built in SWR meter to adjust the antenna turning for maximum reflected power.
The radio may be used with any type of 50 ohm base station antenna.

A ground plane vertical antenna will provide the most uniform horizontal coverage. This type of antenna is best suited for communication with a mobile unit. For point to point operation where both stations are fixed, a directional beam will usually increase communicating range since this type of antenna concentrates transmitted energy in one direction. The beam antenna also allows the receiver to "listen" in only one direction, trues reducing interfering signals.

OPERATING PROCEDURES TO RECEIVE

1. Turn the radio ON by pressing the POWER switch.

2. Press the "Mode" selection button (labeled "5" on the button) continuously until you find the mode of operation you desire to operate in (AM, FM, USB, LSB).

3. Adjust the VOLUME control until you reach your desired listening level.

4. Turn the frequency selector knob to the desired operating frequency.

5. Turn the RF GAIN control completely clockwise.

6. Adjust the "CLARIFIER" control to clarify the SSB signals.

7. Listen to the background noise coming from the radio. Turn the squelch control slowly until the noise just disappears. (No signal should now be present). Leave the control at this setting. The SQUELCH is now properly adjusted. The receiver will remain quiet until a signal is actually received. Do not advance the knob too far, as some of the weaker signals will not be heard.

OPERATING PROCEDURE TO TRANSMIT

1. Select the desired frequency of transmission.

2. Set the MIC GAIN control fully clockwise.

3. Activate the press to talk switch. The receiver and transmitter are controlled by the press to talk switch on the microphone. Press the switch and the transmitter is activated. Release the switch to receiver.

4. Hold the microphone two inches from your mouth, speak in a clear normal voice.

5. The S-TX meter will indicate power output and the modulation meter will indicate percentage of modulation as you speak into the microphone.

CAUTION : Be sure the antenna is properly connected to the radio before transmitting. Transmitting without an antenna or a poorly matched antenna could cause damage to the transmitter.

RECEIVING SSB SIGNALS

* There are four types of signals presently used for communications in the Citizen Band: AM, FM, USB and LSB. When the MODE switch on your unit is placed in the AM position, only standard double sideband, fully carrier signals will be detected. An SSB signal may be recognized while in the AM mode to produce an intelligible output. The USB and LSB modes will detect upper sideband and lower sideband respectively, and standard AM signals.

* SSB reception differ from standard AM reception in that SSB receiver does not require a carrier or opposite sideband to produce an intelligible signal. A single sideband transmitted signal consists only of the upper or the lower sideband and no carrier is transmitter. The eliminate of the carrier from the AM signal helps to eliminate the biggest cause of whistles and tones heard on channels which make even moderately strong AM signals unreadable. Also, SSB take only half of an AM mode, therefore two SSB conversations will fit into each frequency, expanding the two time frequency. The reduction in channel space required also helps in the receiver because only half of the noise and interference can be received with 100% of the SSB signal.

* A SSB signal may be received only when the listening receiver is functioning in the same mode. In other words, an Upper Sideband Signal (USB) may be made intelligible only if the receiver is functioning in the USB position.

* If a Lower Sideband (LSB) signal is heard when the receiver is in the USB mode, no amount of turning will make the signal intelligible. The reason for this may be understood if you consider that when the modulation is applied to the transmitter's microphone in the USB mode, the transmitter's output frequency is increased whereas in the LSB mode the transmitter's output frequency is decreased. The result in listening to the receiver is that when the MODE switch is in the proper position (either USB or LSB), a true reproduction of single tone of modulation will result, and if the tone is increased in frequency (such as a low pitched whistle or a high pitched whistle) you will hear the increase in the output tone of the receiver. If the incorrect mode is selected, an increase in tone of a whistle applied to the transmitter will cause a decrease in the resultant tone from the receiver.

* Thus when a voice is used in place of a whistle or a tone, in the proper listening mode the voice will be translated backwards and cannot be made intelligible by the voice lock control. When listening to an AM transmission, a correct side band is heard in either mode since both upper and lower sideband are received. Once the desired SSB mode has been selected, frequency adjustment may be necessary in order to make the incoming signal intelligible. The CLARIFIER controls allow the operator to vary the frequency above and below the exact center frequency of the received signal. If the sound of the incoming signal is too high or too low pitched, adjust the CLARIFIER control. Consider it as performing the same function as a Dictaphone speed control. When the speed is set too high, voices will be high pitched, and if set too low, voices will be low pitched. Also, there is only one correct speed that will make a particular tape produce the same sound that was recorded. If the tape is played on a player that rotates in the wrong direction (opposite sideband), no amount of speed control (Clarifier) will produce an intelligible sound.

* An AM signal received while listening in one of the SSB modes will produce a steady tone (carrier) in addition to the intelligence, unless the SSB receiver is tumed to exactly the same frequency by the Clarifier control. For simplicity it is recommended the AM modes be used to listen to AM signals.